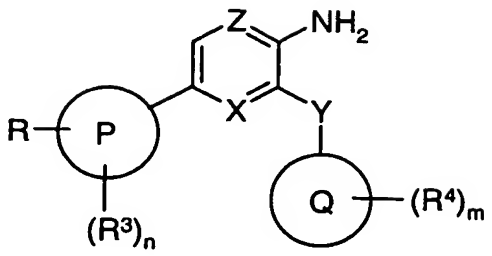
CLAIMS

1. A compound having the formula **I**



wherein:

Z is N;

Y is $CONR^5$, NR^5CO, SO_2NR^5, NR^5SO_2, CH_2NR^5, NR^5CH_2, NR^5CONR^5, C_{1-6}alkylene, CH_2CO, $COCH_2$, CH=CH, OCH_2 or CH_2O;

X is CH or N;

P is phenyl or a 5 or 6 membered heteroaromatic ring containing one or more heteroatoms independently selected from N, O or S and said phenyl ring or heteroaromatic ring may optionally be fused with a 5 or 6 membered saturated, partially saturated or unsaturated ring containing one or more atoms selected from C, N, O or S;

Q is phenyl or a 5 or 6 membered heteroaromatic ring containing one or more nitrogen atoms and said phenyl ring or heteroaromatic ring ring may optionally be fused with a 5 or 6 membered saturated, partially saturated or unsaturated ring containing one or more atoms selected from C, N, O or S;

R is C_{1-6}alkyl$NR^{10}R^{11}$ or C_{1-6}alkylazetidine which azetidine ring may be optionally substituted by A;

R^3 and R^4 are independently selected from halo, nitro, CHO, C_{0-6}alkylCN, OC_{1-6}alkylCN, C_{0-6}alkylOR^6, OC_{1-6}alkylOR^6, fluoromethyl, difluoromethyl, trifluoromethyl, fluoromethoxy, difluoromethoxy, trifluoromethoxy, C_{0-6}alkylNR^6R^7, OC_{1-6}alkylNR^6R^7, OC_{1-6}alkylOC_{1-6}alkylNR^6R^7, NR^6OR^7 C_{0-6}alkylCO_2R^6, OC_{1-6}alkylCO_2R^6, C_{0-6}alkylCONR^6R^7, OC_{1-6}alkylCONR^6R^7, OC_{1-6}alkylNR^6(CO)R^7, C_{0-6}alkylNR^6(CO)R^7, O(CO)NR^6R^7, NR^6(CO)OR^7, NR^6(CO)NR^6R^7, O(CO)OR^6, O(CO)R^6, C_{0-6}alkylCOR^6, OC_{1-6}alkylCOR^6, NR^6(CO)(CO)R^6, NR^6(CO)(CO)NR^6R^7, SR^6, C_{0-6}alkyl(SO_2)NR^6R^7, OC_{1-6}alkylNR^6(SO_2)R^7, OC_{0-6}alkyl(SO_2)NR^6R^7, C_{0-6}alkyl(SO)NR^6R^7, OC_{1-6}alkyl(SO)NR^6R^7, SO_3R^6, C_{0-6}alkylNR^6(SO_2)NR^6R^7, C_{0-6}alkylNR^6(SO)R^7, OC_{1-6}alkylNR^6(SO)R^7, OC_{0-6}alkylSO_2R^6, C_{0-6}alkylSO_2R^6, C_{0-6}alkylSOR^6, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl and C_{0-6}alkylheteroaryl, wherein any C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl and C_{0-6}alkylheteroaryl may be optionally substituted by one or more A;

m is 0, 1, 2, 3 or 4;

n is 0, 1, 2, 3 or 4;

R^5 is hydrogen, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl, C_{0-6}alkylheteroaryl, C_{1-6}alkylNR^6R^7 or C_{1-6}alkylCONR^6R^7;

R^6 and R^7 are independently selected from hydrogen, C_{1-6}alkyl, (CO)OR^8, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl, C_{0-6}alkylheteroaryl and C_{1-6}alkylNR^8R^9;

R^6 and R^7 may together form a substituted 5 or 6 membered heterocyclic ring containing one or more heteroatoms independently selected from N, O or S, which heterocyclic ring may be optionally substituted by A;

R^8 and R^9 are independently selected from hydrogen, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl and C_{0-6}alkylheteroaryl;

R^8 and R^9 may together form a 5 or 6 membered heterocyclic ring containing one or more heteroatoms independently selected from N, O or S, which heterocyclic ring may be optionally substituted by A;

R^{10} is hydrogen, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, C_{0-6}alkylaryl, C_{0-6}alkylheteroaryl or C_{1-6}alkylNR^8R^9;

R^{11} is C_{0-6}alkylC_{3-6}cycloalkyl;

A is halo, nitro, CHO, CN, OR^6, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{0-6}alkylC_{3-6}cycloalkyl, fluoromethyl, difluoromethyl, trifluoromethyl, fluoromethoxy, difluoromethoxy, trifluoromethoxy, C_{0-6}alkylNR^6R^7, OC_{1-6}alkylNR^6R^7, CO_2R^8, $CONR^6R^7$, $NR^6(CO)R^6$, $O(CO)R^6$, COR^6, SR^6, $(SO_2)NR^6R^7$, $(SO)NR^6R^7$, SO_3R^6, SO_2R^6 or SOR^6;

as a free base or a pharmaceutically acceptable salt, solvate or solvate of salt thereof.

2. A compound according to claim 1, wherein Z is N; Y is $CONR^5$; X is N; P is phenyl; Q is a 6 membered aromatic heterocyclic ring containing one nitrogen atom; R is C_{1-6}alkyl$NR^{10}R^{11}$; m is 0; n is 0; R^5 is hydrogen; R^{10} is hydrogen or C_{0-6}alkylC_{3-6}cycloalkyl; C_{0-6}alkylaryl, C_{0-6}alkylheteroaryl or C_{1-6}alkylNR^8R^9; and R^{11} is C_{0-6}alkylC_{3-6}cycloalkyl.

3. A compound according to claim 2, wherein C_{1-6}alkyl in C_{1-6}alkyl$NR^{10}R^{11}$ represents propyl; R^{10} and R^{11} represents cyclobutyl; and Q represents pyridin.

4. A compound which is:
3-Amino-6-{4-[3-(dicyclobutylamino)propyl]phenyl}-*N*-pyridin-3-ylpyrazine-2-carboxamide hydrochloride;
as a free base or an alternative pharmaceutically acceptable salt, solvate or solvate of salt thereof

5. A compound which is:

3-Amino-6-bromo-*N*-pyridin-3-ylpyrazine-2-carboxamide;

as a free base, a salt, solvate or solvate of a salt thereof.

6. A compound which is:

N-[3-(4-Bromophenyl)propyl]-*N*,*N*-dicyclobutylamine;

as a free base, a salt, solvate or solvate of a salt thereof.

7. A pharmaceutical formulation comprising as active ingredient a therapeutically effective amount of a compound according to any one of claims 1 to 4 in association with pharmaceutically acceptable carriers or diluents.

8. The pharmaceutical formulation according to claim 7 for use in the prevention and/or treatment of conditions associated with glycogen synthase kinase-3.

9. A compound as defined in any one of claims 1 to 4 for use in therapy.

10. Use of a compound according to any one of claims 1 to 4 in the manufacture of a medicament for prevention and/or treatment of conditions associated with glycogen synthase kinase-3.

11. Use of a compound according to any one of claims 1 to 4 in the manufacture of a medicament for prevention and/or treatment of dementia, Alzheimer's Disease, Parkinson's Disease, Frontotemporal dementia Parkinson's Type, Parkinson dementia complex of Guam, HIV dementia, diseases with associated neurofibrillar tangle pathologies and dementia pugilistica.

12. Use of a compound according to claim 11, wherein the disease is Alzheimer's Disease.

13. Use of a compound according to any one of claims 1 to 4 in the manufacture of a medicament for prevention and/or treatment of amyotrophic lateral sclerosis, corticobasal degeneration, Down syndrome, Huntington's Disease, postencephelatic parkinsonism,

progressive supranuclear palsy, Pick's Disease, Niemann-Pick's Disease, stroke, head trauma and other chronic neurodegenerative diseases, Bipolar Disease, affective disorders, depression, schizophrenia, cognitive disorders, hair loss and contraceptive medication.

14. Use of a compound according to any one of claims 1 to 4 in the manufacture of a medicament for prevention and/or treatment of predemented states, Mild Cognitive Impairment, Age-Associated Memory Impairment, Age-Related Cognitive Decline, Cognitive Impairement No Dementia, mild cognitive decline, mild neurocognitive decline, Late-Life Forgetfulness, memory impairment and cognitive impairment, vascular dementia, dementia with Lewy bodies, Frontotemporal dementia and androgenetic alopecia and Type I and Type II diabetes, diabetic neuropathy and diabetes related disorders.

15. A method of prevention and/or treatment of conditions associated with glycogen synthase kinase-3, comprising administrering to a mammal, including man in need of such prevention and/or treatment, a therapeutically effective amount of a compound of formula I as defined in any one of claims 1 to 4.

16. A method of prevention and/or treatment of dementia, Alzheimer's Disease, Parkinson's Disease, Frontotemporal dementia Parkinson's Type, Parkinson dementia complex of Guam, HIV dementia, diseases with associated neurofibrillar tangle pathologies and dementia pugilistica, comprising administrering to a mammal, including man in need of such prevention and/or treatment, a therapeutically effective amount of a compound of formula I as defined in any one of claims 1 to 4.

17. The method according to claim 16, wherein the disease is Alzheimer's Disease.

18. A method of prevention and/or treatment of amyotrophic lateral sclerosis, corticobasal degeneration, Down syndrome, Huntington's Disease, postencephelatic parkinsonism, progressive supranuclear palsy, Pick's Disease, Niemann-Pick's Disease, stroke, head trauma and other chronic neurodegenerative diseases, Bipolar Disease, affective disorders, depression, schizophrenia, cognitive disorders, hair loss and contraceptive medication, comprising administrering to a mammal, including man in need of such prevention and/or

treatment, a therapeutically effective amount of a compound of formula I as defined in any one of claims 1 to 4.

19. A method of prevention and/or treatment of predemented states, Mild Cognitive Impairment, Age-Associated Memory Impairment, Age-Related Cognitive Decline, Cognitive Impairement No Dementia, mild cognitive decline, mild neurocognitive decline, Late-Life Forgetfulness, memory impairment and cognitive impairment, vascular dementia, dementia with Lewy bodies, Frontotemporal dementia and androgenetic alopecia and Type I and Type II diabetes, diabetic neuropathy and diabetes related disorders, comprising administrering to a mammal, including man in need of such prevention and/or treatment, a therapeutically effective amount of a compound of formula I as defined in any one of claims 1 to 4.

20. The use of the intermediates according to claim 5 or 6 for the preparation of a compound of formula I as defined in any one of claims 1 to 4.